No. 9500089

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

ALFALFA

'5312'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirty-first day of March in the year of our Lord one thousand nine hundred and ninety-seven.*

Attest:

Marsha A. Stanton
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Dan Glickman
Secretary of Agriculture

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Pioneer Hi-Bred International, Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.
XAE11

3. VARIETY NAME
5312

4. ADDRESS *(street and no. or R.F.D. no., city, state, and ZIP)*
7305 N. W. 62nd Ave., P. O. Box 287
Johnston, IA 50131

5. PHONE *(Include area code)*
515-270-3340

FOR OFFICIAL USE ONLY

PVPO NUMBER
9500089

FILING
Date: Feb. 10, 1995
Time: ☑ A.M. ☐ P.M.

FEES RECEIVED
Filing and Examination Fee: $2150 + 175.00
Date: 1/27/95 + 2/22/95
Certificate Fee: $ 300
Date: 3/24/97

6. GENUS AND SPECIES NAME
Medicago sativa

7. FAMILY NAME *(Botanical)*
Leguminosae

8. CROP KIND NAME *(Common Name)*
Alfalfa

9. DATE OF DETERMINATION
September, 1992

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

12. DATE OF INCORPORATION
1926

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
William T. W. Woodward, 7305 N. W. 62nd Ave., P. O. Box 287, Johnston, IA 50131
John Hintze, 700 Capital Square, 400 Locust Street, Des Moines, IA 50309
Mike Roth, 700 Capital Square, 400 Locust Street, Des Moines, IA 50309

PHONE *(Include area code)*:

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow INSTRUCTIONS on reverse)*

a. ☒ Exhibit A, Origin and Breeding History of the Variety.
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety.
d. ☒ Exhibit D, Additional Description of Variety.
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.
f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office 1/18/95.
g. ☒ Filing and Examination Fee ($2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See section 83(a) of the Plant Variety Protection Act.)*
☐ YES *(If "YES," answer items 16 and 17 below)* ☒ NO *(If "NO," skip to item 18 below)*

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES *(If "YES," through* ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____.)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☐ NO Planned for USA, Spring, 1994.

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE
PIONEER HI-BRED INTERNATIONAL, INC.		
By William T. W. Woodward	Director, Department of Alfalfa Breeding	1/18/95

FORM CSSD-470 (5-89) Edition of FORM LS-470, 3-86, is obsolete

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF THE VARIETY
(Amended 8/12/96)

'5312'

5312 is a synthetic variety with 195 parent plants originating from a Pioneer experimental line tracing to the varieties 5373, 5262, 5364 and an experimental 84CF052. 84CF052 further traces to 521, Apollo, *M. falcata*, Vernal, Narragansett, Scout, WL202, 520, and *M. falcata* x *M. sativa* single crosses. Parent plants resulted through phenotypic recurrent selection for resistance to one or more of the following; Aphanomyces root rot, Verticillium wilt, and anthracnose (Race1).

During seed multiplication no variates beyond the limits defined under Exhibit C have been found. Multiplication procedures will insure that seed being sold as 5312 will not be shifted in characteristics beyond presently acceptable limits for alfalfa varieties. Syn 1 seed harvested from individual plants in cage isolation in 1989 is considered breeder seed.

It is confirmed that 5312 meets presently acceptable levels for uniformity for alfalfa varieties.

EXHIBIT B

NOVELTY STATEMENT (amended 8/12/96)

'5312'

5312 most closely resembles the variety '5252'. 5312 differs from 5252 in spotted alfalfa aphid resistance being classified as having high resistance with 54% resistant plants while 5252 is appropriately classified as having moderate resistance with 25% resistant plants. It also differs in flower color having only 2% blue, while 5252 has 20% blue flower color.

-66
24-
AAA 4 mar 1997 rev letter

FORM APPROVED. OMB NO. 0581-0055

EXHIBIT C
(Alfalfa)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

OBJECTIVE DESCRIPTION OF VARIETY
ALFALFA *(Medicago sativa* sensu Gunn et al.*)*

NAME OF APPLICANT(S)	TEMPORARY DESIGNATION	VARIETY NAME
Pioneer Hi-Bred International, Inc.	XAE11	5312

ADDRESS *(Street and No., or R.F.D. No., City, State, and Zip Code)*
7305 N. W. 62nd Ave., P. O. Box 287
Johnston, IA 50131-0287

FOR OFFICIAL USE ONLY
PVPO NUMBER
9500089

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place numbers in the boxes to designate the expressions which are characteristic of the commerical generations of the application variety. Data for quantitative plant characters should be based on a minimum of 100 plants. Include leading zeros when necessary (e.g., [0][8][9]) for quantitative data. Comparative data should be determined from varieties entered in the same trial. Plant color may be precisely designated by using any recognized color chart, e.g., The Munsell Plant Tissue Color Charts.

1. WINTERHARDINESS:

[7] CLASS:
1 = Very Non-Winterhardy (CUF 101)
2 = Non-Winterhardy (Moapa 69)
3 = Intermediately Non-Winterhardy (Mesilla)
4 = Semi-Winterhardy (Lahontan)
5 = (Du Puits)
6 = Moderately Winterhardy (Saranac)
7 = (Ranger)
8 = Winterhardy (Vernal)
9 = Extremely Winterhardy (Norseman)

TEST LOCATION: Arlington, Wisconsin

2. FALL DORMANCY:

FALL DORMANCY (DETERMINED FROM SPACED PLANTINGS)

TESTING INSTITUTION AND LOCATION	DATE OF LAST CUT	DATE REGROWTH SCORED	REGROWTH SCORE OR AVERAGE HEIGHT				LSD .05
			APPLICATION VARIETY	CHECK VARIETIES*			
				Vernal	Ranger	Saranac	
Pioneer Hi-Bred International, Inc., Johnston, Iowa	9/93	10/93	21.3	16.7	22.8	24.1	2.4

* CUF 101, Moapa 69, Mesilla, Lahontan, Du Puits, Saranac, Ranger, Vernal, or Norseman as appropriate.

Specify scoring system used: Natural plant height measured in CM

[6] Fall Growth Habit (Determined from Fall Dormancy Trials)
1 = Erect (CUF 101)
3 = Semierect (Mesilla)
5 = Intermediate (Saranac)
7 = Semidecumbent (Vernal)
9 = Decumbent (Norseman)

3. RECOVERY AFTER FIRST SPRING CUT (In Southwest, first cut after March 21):

[3]
1 = Very Fast (CUF 101)
3 = Fast (Saranac)
5 = Intermediate (Ranger)
7 = Slow (Vernal)
9 = Very Slow (Norseman)

TEST LOCATION: Johnston, Iowa; Quarryville, PA; Arlington, WI; Connel, WA

4. AREAS OF ADAPTATION IN U.S. (Where tested and proven adapted):

[1] Primary Area of Adaptation
[2] [6] Other Areas of Adaptation

1 = North Central
2 = East Central
3 = Southeast
4 = Southwest
5 = Moderately Winterhardy Intermountain
6 = Winterhardy Intermountain
7 = Great Plains
8 = Other *(Specify)* _____

5. FLOWERING DATE (When 10% of plants possess open flowers at time of first spring cut):

[ ][ ] Days Earlier Than [ ]
Same As [ ]
[ ][ ] Days Later Than [ ]

1 = CUF 101
2 = Mesilla
3 = Saranac
4 = Vernal
5 = Norseman

TEST LOCATION: _____

4

6. PLANT COLOR (Determined from healthy regrowth 3 weeks after first spring cut, controlling leafhoppers if necessary):

[ ] 1 = Very Dark Green (524) 2 = Dark Green (Vernal) 3 = Light Green (Ranger)

COLOR CHART VALUE (Specify chart used): _____):

APPLICATION VARIETY: _____

VERNAL: _____

TEST LOCATION: _____

7. CROWN TYPE (Determined from spaced plantings):

[2] Noncreeping Types: 1 = Broad (Vernal) 2 = Intermediate (Saranac) 3 = Narrow (CUF 101)

Creeping Types: 4 = Creeping Rooted (Rangelander) 5 = Rhizomatous (Rhizoma)

8. FLOWER COLOR (Determine frequency of plants for each color class as defined by USDA Agricultural Handbook No. 424 (Barnes 1972), allowing all plants in plot to flower):

[0 9 5] % Purple and Violet (Subclasses 1.1 to 1.4)

[0 0 3] % Variegated Other Than Blue (Subclasses 2.1, 2.2, 2.5 to 2.9)

[t] % Cream (Class 3)

[0 0 2] % Blue (Subclasses 2.3 and 2.4)

[t] % Yellow (Subclasses 4.1 to 4.4)

[t] % White (Class 5)

TEST LOCATION: ~~Johnston, IA~~

9. POD SHAPE (Determine frequency of plants with the following pod shapes produced on well cross-pollinated racemes):

[ ] % Tightly Coiled (One or more coils, center more or less closed)

[ ] % Sickle (Less than 1 coil)

[ ] % Loosely Coiled (One or more coils, center conspicuously open)

TEST LOCATION: _____

10. PEST RESISTANCE: Provide in the appropriate column, trial data for application variety, and resistant (R) and susceptible (S) check varieties, synthetic generation tested, average severity index scores (ASI), least significant difference statistics (LSD .05), the institution in charge of test, year, and location of test, and whether test is a field or laboratory evaluation. Describe scoring system, and any test procedure which differs from standard methods proposed by Elgin (1982). Trial data from other test years or locations should be presented whenever available on a separate document as Exhibit D.
Seeds of the check varieties and germplasm lines listed below can be obtained from the USDA Field Crops Laboratory, Bldg. 001, Rm. 335, BARC-West, Beltsville, MD 20705. Although comparisons with check varieties listed below are preferred, comparisons with any appropriate check variety recommended by Elgin (1982) may be presented.

A. DISEASE RESISTANCE: DISEASE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Anthracnose, Race 1 *(Colletotrichum trifolii)*	Application HR	1	57.0	Approx 300		Percent Resistant Plants 10.0	Pioneer Hi-Bred International, In 1992 Epuiseau, France Laboratory
	Arc (R)		65.0	"			
	Saranac (S)		4.2	"			
	SCORING SYSTEM: NAAIC Standard Tests. Data adjusted to Arc at 65% resistant plants by Pioneer Hi-Bred International, Inc.						
Anthracnose, Race 2 *(Colletotrichum trifolii)*	Application						
	Saranac AR (R)						
	Arc (S)						
	SCORING SYSTEM:						
Bacterial Wilt *(Corynebacterium insidiosum)*	Application HR	1	69.4	Approx. 175		Percent Resistant Plants 11.6	Pioneer Hi-Bred International, I 1992 Arlington, WI Field
	Vernal (R)		42.0	"			
	Narragansett (S)		2.8	"			
	SCORING SYSTEM: NAAIC standard tests. Data adjusted to Vernal at 42% resistant plants by Pioneer Hi-Bred International, Inc.						
Common Leafspot *(Pseudopeziza medicaginis)*	Application						
	MSA-CW3AN3 (R)						
	Ranger (S)						
	SCORING SYSTEM:						

10. A. PEST RESISTANCE (Continued):

DISEASE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Downy Mildew *(Peronospora trifoliorum)*	Application						
Isolate, if known:	Saranac (R)						
	Kanza (S)						
	SCORING SYSTEM:						
Fusarium Wilt *(Fusarium oxysporum f. medicaginis)*	Application HR	1	70.9	Approx. 200		Percent Resistant Plants 12.6	Pioneer Hi-Bred International, Inc 1992 Quarryville, PA Field
	Agate HR		54.0	"			
	MNGN-1 S		4.9	"			
	SCORING SYSTEM: NAAIC standard tests. Data adjusted to Agate at 54% resistant plants by Pioneer Hi-Bred International, Inc.						
Phytophthora Root Rot *(Phytophthora megasperma f. medicaginis)*	Application HR	1	56.5	Approx. 300		Percent Resistant Plants 11.8	Pioneer Hi-Bred International, Inc 1992 Arlington, WI Laboratory
	Agate (R)		43.0	"			
	Saranac (S)		0.0	"			
	SCORING SYSTEM: NAAIC standard tests. Data adjusted to Agate at 43% resistant plants by Pioneer Hi-Bred International, Inc.						
Verticillium Wilt *(Verticillium alboatrum)*	Application HR	1	58.1	Approx. 200		Percent Resistant Plants 18.0	Pioneer Hi-Bred International, Inc 1990 Arlington, WI Laboratory
	Vertus (R)		40.0	"			
	Saranac (S)		6.4	"			
	SCORING SYSTEM: NAAIC standard tests. Data adjusted to Vertus at 40% resistant plants by Pioneer Hi-Bred International, Inc.						
Other *(Specify)* Aphanomyces Root Rot	Application R	1	42.3	Appox. 185		Percent Resistant Plants 8.5	Pioneer Hi-Bred International, Inc 1992 Arlington, WI Laboratory
	(R) WAPH-1		50.0	"			
	(S) Agate		1.2	"			
	SCORING SYSTEM: NAAIC standard tests. Data adjusted to WAPH-1 at 50% resistant plants by Pioneer Hi-Bred International, Inc.						
Other *(Specify)*	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

B. INSECT RESISTANCE: INSECT	VARIETY	SYN. GEN. TESTED	PERCENT DEFOLIATION	DEFOLIATION IN PERCENT OF RESISTANT CHECK	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Alfalfa Weevil *(Hypera postica)*	Application						
	Arc (R)			100			
	Saranac (S)						
	SCORING SYSTEM:						

6

10. B. INSECT RESISTANCE (Continued):

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT SEEDLING SURVIVAL	NUMBER OF SEEDLINGS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Blue Alfalfa Aphid *(Acyrthosiphon kondoi)*	Application						
	CUF 101 (R)						
	PA-1 (S)						
	SCORING SYSTEM:						
Pea Aphid *(Acyrthosiphon pisum)*	Application HR	2	56.7	Approx. ~~300~~		Percent Resis-	Pioneer Hi-Bred International, In
	~~Xxxxx~~PA-1 R		55.0	"		tant Plants	1993 Johnston, IA
	~~Xxxxx~~Vernal S		6.9	"		17.7	Laboratory
	SCORING SYSTEM: NAAIC standard tests. Data adjusted to PA-1 at 55% resistant plants by Pioneer Hi-Bred International, Inc.						
Spotted Alfalfa Aphid *(Therioaphis maculata)* *Biotype, if known:* ~~Occurrence~~ in Fresno ~~county, CA~~	Application HR	1	54.2	Approx. ~~200~~		Percent Resis-	Pioneer Hi-Bred International, In
	~~Xxxxx~~ Baker R		50.0	"		tant Plants	1991 Kerman, CA
	~~Xxxxx~~ Arc S		0.0	"		17.5	Laboratory
	SCORING SYSTEM: NAAIC standard tests. Data adjusted to Baker at 50% resistant plants by Pioneer Hi-Bred International, Inc.						

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Potato Leafhopper Yellowing *(Empoasca fabae)*	Application						
	MSA-CW3An3 (R)						
	Ranger (S)						
	SCORING SYSTEM:						
Other *(Specify)*	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

C. NEMATODE RESISTANCE:

NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Northern Root Knot *(Meloidogyne hapla)*	Application						
	Nev. Syn. XX (R)						
	Lahontan (S)						
	SCORING SYSTEM:						

10. C. NEMATODE RESISTANCE (Continued):

NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Southern Root Knot *(Meloidogyne incognita)*	Application						
	Moapa 69 (R)						
	Lahontan (S)						
	SCORING SYSTEM:						
Stem Nematode *(Ditylenchus dipsaci)*	Application LR	2	13.3	Approx. ~~200~~		Percent Resist-ant Plants 10.6	Pioneer Hi-Bred International, Inc. 1993 Connell, WA Laboratory
	Lahontan (R)		50.0	"			
	Ranger (S)		7.8	"			
	SCORING SYSTEM: NAAIC standard tests. Data adjusted to Lahontan at 50% resistant plants by Pioneer Hi-Bred International, Inc.						
Other *(Specify)*	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

11. INDICATE THE VARIETY THAT MOST CLOSELY RESEMBLES THE APPLICATION VARIETY FOR EACH OF THE FOLLOWING CHARACTERS:

CHARACTER	VARIETY	CHARACTER	VARIETY
Winterhardiness	Ranger	Plant Color	–
Recovery After 1st Cut	Saranac	Crown Type	5252
Area of Adaptation	5432	Combined Disease Resistance	5252
Flowering Date	–	Combined Insect Resistance	5364

REFERENCES

Barnes, D.K. 1972. A System for Visually Classifying Alfalfa Flower Color. U.S. Dep. Agric. Handb. 424. 18 pp. (Note: Greenish cast of plate 6, A and B is an artifact of printing, actual colors a blend of yellow and white.)

Elgin, J.H., Jr., (ed.). 1982. Standard Tests to Characterize Pest Resistance in Alfalfa Cultivars. U.S. Dep. Agric. Tech. Bull. (In Press).

Gunn, C.R., W.H. Skrdla, and H.C. Spencer. 1978. Classification of Medicago sativa L. using legume characters and flower colors. U.S. Dep. Agric. Tech. Bull. 1574. 84 pp.

Munsell Color Co. 1977. Munsell Plant Tissue Color Charts. Munsell Color Co., Inc. Baltimore.

NOTE: Any additional descriptive information and supporting documentation may be provided as Exhibit D.

EXHIBIT D

'5312'

1. 5312 is a synthetic variety with 195 parent plants originating from an experimental line tracing to the varieties 5373, 5262, 5364 and a Pioneer experimental 84CF052. Parent plants resulted through phenotypic recurrent selection for resistance to one or more of the following: Aphanomyces root rot (Race 1), Phytophthora root rot, bacterial wilt, Verticillium wilt and anthracnose (Race 1). Germplasm sources are M. falcata (6%), Ladak (9%), M. varia (27%), Turkistan (5%), Flemish (43%), Chilean (9%), and unknown (1%).

2. 5312 is adapted to and intended for use in the north central, east central and winterhardy intermountain regions of the United States. The states in which 5312 have been tested are: Iowa, Illinois, Minnesota, New York, Pennsylvania, Wisconsin, Oregon and Washington. It has also been tested in Ontario, Canada.

3. 5312 is a dormant cultivar with a fall dormancy similar to Ranger. Flower color in the Syn 2 generation is approximately 95% purple and 5% variegated, with traces of yellow, white and cream.

4. 5312 has high resistance to bacterial wilt, fusarium wilt, Phytophthora root rot, anthracnose (Race 1), Verticillium wilt, spotted alfalfa aphid and pea aphid; resistance to Aphanomyces root rot (Race 1); low resistance to stem nematode. 5312 has not been adequately tested for blue alfalfa aphid or root knot nematode.

5. Breeder seed (Syn 1) was produced in 1989 on parent plants in cage isolation. Seed classes will be breeder, foundation (Syn 2 or Syn 3) and certified (Syn 2, Syn 3, or Syn 4). Foundation seed may be produced from breeder or foundation. The second generation foundation (Syn 3) may be produced at the discretion of Pioneer Hi-Bred International, Inc. Limitation on ages of stand will be three years and five years, respectively, for foundation seed and certified seed. Sufficient breeder and foundation seed for the projected life of the variety will be maintained by Pioneer Hi-Bred International, Inc.

6. Seed will be marketed in the spring of 1994.

7. Application for Plant Variety Protection will be made and the certification option will not be requested.

8. As a means of added varietal protection, information included with Application for Review of Alfalfa Variety for Certification may be provided to the PVP Office.

SPOTTED ALFALFA APHID TEST CONDUCTED BY PIONEER HI-BRED INTERNATIONAL, INC., AT KERMAN, CA, IN 1991

VARIETY	RESISTANCE CLASS	ADJUSTED PERCENT RESISTANCE
5312	HR	54.2
5252	R	23.5
5364	HR	50.2
BAKER	R	50.0
CUF101	HR	60.9
ARC	S	0.0
CALIVERDE	S	1.0
TEST MEAN		40.9
L.S.D. (.05)		17.5
CV(%)		26.0

95000089

Spotted alfalfa aphid test for 5252 and 5312 using standard tests in 1991 (FR128121):

SPOTTED ALFALFA APHID

Test conducted by Pioneer Hi-Bred International, Inc. at Fresno, CA

Variety	Resistance Class	Year Tested	Syn Gen	Adjusted % R	Score or A.S.I.
Test Variety(5252)	MR	1991	1	23.5	
1. Baker	R			50.0	
2. Arc	S			0.0	
3. 5312	HR		1	54.2	
Test Mean:				40.9	
L.S.D. (.05)				17.5	
C.V. (%)				26	

Test conducted in field _____ **Lab** Greenhouse

Spotted alfalfa aphid test for 5252 and 5312 using standard tests in 1992:

SPOTTED ALFALFA APHID

Test conducted by Pioneer Hi-Bred International, Inc. at Fresno, CA

Variety	Resistance Class	Year Tested	Syn Gen	Adjusted % R	Score or A.S.I.
Test Variety(5252)	MR	1992	2	24.6	
1. Baker	R			50.0	
2. Arc	S			1.0	
3. 5312	HR		2	66.1	
Test Mean:				47.7	
L.S.D. (.05)				21.3	
C.V. (%)				28	

Test conducted in field _____ **Lab** Greenhouse

EXHIBIT E

STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

'5312'

Pioneer Hi-Bred International, Inc., Des Moines, Iowa, is the employer of the plant breeders involved in the development and evaluation of 5312. Pioneer Hi-Bred International, Inc. has the sole rights and ownership of 5312.

REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055 EXPIRES: 12-31-96

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Pioneer Hi-Bred International, Inc.	XAE11	5312

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*	5. TELEPHONE *(include area code)*	6. FAX *(include area code)*
7305 N.W. 62nd Ave. P.O. Box 287 Johnston, IA 50131	(515) 270-3340	(515) 270-3750

7. PVPO NUMBER 9500089

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* If no, please explain. [X] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company?
If no, give name of country _____ [X] YES [ ] NO

10. Is the applicant the original breeder? If no, please answer the following: [X] YES [ ] NO

a. If original rights to variety were owned by individual(s):
Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country _____ [X] YES [ ] NO

b. If original rights to variety were owned by a company:
Is the original breeder(s) U.S. based company? If no, give name of country _____

11. Additional explanation on ownership *(If needed, use reverse for extra space):*

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeders(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original breeder, both the original breeder and the applicant must meet one of the above criteria.

The original breeder may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.